

PROCEEDINGS
OF
THE ROYAL SOCIETY.

1850.

No. 76.

May 2, 1850.

The EARL OF ROSSE, President, in the Chair.

The following papers were read :—

1. "On the Meteorology of England during the years 1847, 1848 and 1849." By James Glaisher, Esq., F.R.S.

At the commencement of this paper the author states, that during the three years ending December 1849, meteorological observations on a uniform system have been taken at nearly forty different places, situated between the latitudes of $49\frac{1}{2}^{\circ}$ and 55° , and between the longitudes of $1\frac{1}{2}^{\circ}$ east and $5\frac{1}{2}^{\circ}$ west of Greenwich, at elevations varying from 30 to 350 feet above the level of the sea.

Many of the instruments which have been used he has himself selected, and prior to their use has determined their index-errors; he has also visited the greater number of the stations, and examined their localities, the position of the instruments, &c.

The results from each station at the end of every quarter were forwarded to him; these he tested in every possible way; and those returns only which were found good enough to stand this examination were published at the end of every quarter in the Quarterly Reports of the Registrar-General. The object of this paper, the author states, to be not only the deduction of mean values from the combination of all these published results, but also the deduction from them of formulæ, for the purpose of testing the accuracy of the observations generally, and thus ascertaining the degree of confidence which may be placed in meteorological observations as now carried on, and if possible the deduction of the errors of the readings of those instruments which had not been directly compared with standards.

He then gives the mean numerical values for the years 1847, 1848 and 1849 in different parallels of latitude. By comparison of these he deduces general formulæ, and then compares the results as found from observation with those deduced from calculation, for every place of observation in the year 1849. Proceeding to the consideration of the difference between these two sets of numbers, he finds them to be mostly small; and hence concludes that the instru-

ments are generally good, and that the observations have been carefully made. In three instances, however, he finds that the readings of the barometer are almost one-tenth of an inch too high, and he purposes to use the differences thus found as index-errors in the reduction of future observations made by these instruments, till their actual index-errors are determined by direct comparison with a standard barometer. In five instances the mean temperature of the year from observations differed almost one degree from that found by calculation. At one of these places only have the instruments been compared with standards, and hence it is very probable that the difference found at this place may be due to local causes, of which this difference is a measure.

He finds also, that, notwithstanding the decrease of temperature with increase of latitude, the temperature of the dew-point, at all places at about the same elevation, and distant from the influence of the sea near the south coast, is almost alike, and hence that the actual amount of water distributed in the atmosphere is the same: this result was unexpected, and if confirmed by subsequent observations will be important.

The author observes that the tables fully explain the peculiarity of the weather in the counties of Cornwall and Devon, and near the sea; the periodical ranges of temperature in these localities being much less than in others, though they are found to enjoy only the mean annual temperatures due to their latitudes.

He remarks that the agreement between the observed and calculated values being found to be so close, the mean meteorological elements for the year 1849 for any place in England may be computed, with a close approximation to the truth.

To his paper are appended some sheets of curves exhibiting the simultaneous results from all the places, and these show that if any two or more places be taken in the same latitudes, the curves are nearly parallel; but, that if curves of places whose latitudes are different be compared, the one is found to be much bolder than the other. He considers that these sheets show in a very satisfactory manner that very considerable confidence may be placed in the results, and that a great advance has taken place within the last few years in the care and attention to meteorological investigation.

2. "On the Temperature of Man within the Tropics." By John Davy, M.D., F.R.S., &c.

In a former paper which was published in the Philosophical Transactions for 1845, the author gave the results of an inquiry on the temperature of man in England, as measured under the tongue by a thermometer made for the purpose, and using certain precautions necessary to ensure accuracy. An inquiry of the same kind and with the same instrument he has conducted in the West Indies, extending over a period of nearly three years and a half. This is the subject of his present communication. For the sake of comparison, he has followed in it nearly the same order as in the former. The results are given in a tabular form, divided into sections, and are followed by an appendix in which are recorded the daily obser-